太古代インド南部ダールワール岩体に分布する堆積岩層序の年代と変成作用

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Archaean supracrustal sequences of Dharwar Craton, southern India

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We have assessed the Archaean metasedimentary sequences of the Archaean Dharwar Craton in southern India in terms of their protoliths, potential timing of deposition and metamorphic events along with metamorphic conditions (Hokada et al., 2013). The lower unit of the Chitradurga Schist Belt in Western Dharwar is metamorphosed under biotite-muscovite grade, whereas the upper unit at chlorite-muscovite grade. Detrital zircon U–Pb dates obtained by SHRIMP analyses suggest 3.14 Ga and 3.22–2.92 Ga for the youngest protolith's magmatic ages, which constrain the oldest age limit of deposition of Bababudan Group and Lower Unit of Chitradurga Group, respectively. The depositional age of Upper Unit of Chitradurga Schist Belt can be bracketed by 2.68 Ga magmatic zircon ages from meta-rhyolite and 2.63 Ga magmatic detrital zircon age of the overlying sandstone that are significantly younger than the Lower Unit. Monazite U–Th–Pb ages are similar for both Lower and Upper Units of the Chitradurga Group (~c. 2.4 Ga) but are significantly younger than those of the underlying Bababudan and Sargur Groups (~c. 3.1 Ga). Combined zircon and monazite data imply that the continuous or composite Mesoarchaean-Neoarchaean supracrustal sequences of this part of Archaean metasedimentary sequences in Dharwar Craton are metamorphosed together at the latest Archaean-early Proterozoic. These regional metamorphic ages are not detected in the underlying Bababudan and Sargur Groups, as well as the basement Peninsular Gneiss. Contrasting depositional and metamorphic history in the Chitradurga Schist Belt have important implications for the comparison with the well-established sedimentary sequences of similar ages in the Pilbara and Kaapvaal cratons. The protolith and metamorphic ages of the Dharwar Supergroup, when compared with available similar information from the surrounding Archaean cratons in India, Madagascar, and East Antarctica, testify the probable Archaean connection, and give clues to the formation of deep to shallow Archaean crust.

References

Hokada, T., et al., An appraisal of Archaean supracrustal sequences in Chitradurga Schist Belt, Western Dharwar Craton, Southern India, Precambrian Research, 227, 99-119 , 2013.